

## AMBIENT AIR MONITORING RESULTS AT THE WASTE ISOLATION PILOT PLANT (WIPP) AND THE VICINITY CARLSBAD, NEW MEXICO

Example table of results	pCi/sample					Bq/sample				
	Analyte	Result	±1 s TPU	±2 s TPU	MDA	Lab Flag	Result	±1 s TPU	±2 s TPU	MDA
Gross alpha and beta activity										
Gross alpha	1.6	1.6	3.2	0.55			0.0592	0.0592	0.1184	0.02035
Gross beta	19	0.25	0.50	1.1			0.703	0.00925	0.0185	0.0407
Alpha and beta emitters										
Americium-241	0.0032	0.0085	0.0170	0.033	U		0.000118	0.000315	0.000629	0.001221
Gamma emitters										
Bismuth-214	8.3	2.3	4.6	7	J		0.3071	0.0851	0.1702	0.259
Lead-214	4.3	1.6	3.2	5.1	UJ		0.1591	0.0592	0.1184	0.1887

### How to interpret the table

TPU is the **total propagated uncertainty**. The values of experimental measurements have uncertainties due to measurement limitations (e.g., instrument precision, chemical separation, etc.). These uncertainties propagate with the combination of variables in the function. The **uncertainty** is usually defined by the absolute error  $\Delta x$ . In measurements of radioactivity, TPU is an expression of the confidence that the actual value lies within a plus or minus range. "1 TPU" is plus or minus one standard deviation. This means that the true value of the measurement (the result) is within the range of plus or minus the TPU of the result with a certainty or confidence of about **68.3%**. The confidence that the actual measurement lies within the range of **2 TPU** (plus or minus 2 standard deviations) is about **95.5%**. Three standard deviations provides about 99.7% confidence that the actual measured value lies within the calculated range of possible values. The result is given for the sample analyzed.

There is a 95.5% probability that the actual measurement for gross beta in the chart above exists within the range of 19.5 to 18.5 pico Curies per sample (pCi/Sample). In other words, we can say with 95.5% confidence that the actual measurement of beta activity is between 18.5 and 19.5 pCi/sample, or about 19 pCi.

The **MDA** is the **minimum detectable activity** (or concentration) defined as the smallest concentration of radioactivity in a sample that can be detected with a 5% probability of erroneously detecting radioactivity, when in fact none was present (Type I error) and also, a 5% probability of not detecting radioactivity, when in fact it is present (Type II error). Often used interchangeably with **Minimum Detectable Concentration (MDC)**, since the difference between the two terms is only one of units. The MDC is the minimum detectable activity measured in concentration units.

The **Lab Flag** is a qualifier to the result. A "U" flag means the material was analyzed for, but was not detected above the **MDA** (or MDC). A U flag may be interpreted as a non-detection. A "J" flag means the associated numerical value is an estimated quantity. A J flag may be interpreted to mean the material was detected but is too small to quantify. Multiple flags may be used at borderline measurements.

The Becquerel (Bq) is the International System of Units (SI) derived unit of radioactivity and is defined as the activity of a quantity of radioactive material in which one nucleus decays per second.

1 Becquerel (Bq) equals	2.70E-11 Curies (Ci)
1 pico curies (pCi) equals	0.037 Becquerel (Bq)
1 pico curies (pCi) equals	one trillionth of a curie

**AMBIENT AIR MONITORING RESULTS AT THE WASTE ISOLATION PILOT PLANT (WIPP) AND THE VICINITY  
CARLSBAD, NEW MEXICO**

**WPL01 WIPP Salt Shaft**

**February 21, 2014 to February 28, 2014**

Analyte	pCi/sample					Bq/sample			
	Result	±1 s TPU	±2 s TPU	MDA	Lab Flag	Result	±1 s TPU	±2 s TPU	MDA
Gross alpha and beta activity									
Gross alpha	1.6	0.25	0.5	0.55		0.0592	0.00925	0.0185	0.02035
Gross beta	19	1.6	3.20	1.1		0.703	0.0592	0.1184	0.0407
Alpha and beta emitters									
Americium-241	0.0032	0.0085	0.0170	0.033	U	0.0001184	0.000315	0.000629	0.001221
Plutonium-238	0.0052	0.0063	0.0126	0.019	U	0.0001924	0.000233	0.0004662	0.000703
Plutonium-239/240	0.0077	0.0069	0.0138	0.024	U	0.0002849	0.000255	0.0005106	0.000888
Strontium-90	0.084	0.13	0.26	0.58	U	0.003108	0.00481	0.00962	0.02146
Gamma emitters									
Actinium-228	6.3	4.2	8.4	14	U	0.2331	0.1554	0.3108	0.518
Americium-241	-4.1	4.3	8.6	15	U	-0.1517	0.1591	0.3182	0.555
Beryllium-7	94	11	22	23		3.478	0.407	0.814	0.851
Bismuth-212	2.0	14	28	49	U	0.074	0.518	1.036	1.813
Bismuth-214	8.3	2.3	4.6	7.0	J	0.3071	0.0851	0.1702	0.259
Cesium-134	-2.4	1.1	2.2	3.9	U	-0.0888	0.0407	0.0814	0.1443
Cesium-137	0.15	1.0	2.0	3.6	U	0.00555	0.037	0.074	0.1332
Cobalt-60	0.081	1.4	2.8	4.8	U	0.002997	0.0518	0.1036	0.1776
Iodine-131	-0.54	1.0	2.0	3.5	U	-0.01998	0.037	0.074	0.1295
Lead-212	4.7	1.2	2.4	3.5		0.1739	0.0444	0.0888	0.1295
Lead-214	4.3	1.6	3.2	5.1	UJ	0.1591	0.0592	0.1184	0.1887
Potassium-40	93	19	38	50		3.441	0.703	1.406	1.85
Protactinium-234m	-51	180	360	640	U	-1.887	6.66	13.32	23.68
Sodium-22	0.61	1.1	2.2	3.9	U	0.02257	0.0407	0.0814	0.1443
Thallium-208	2.6	1.1	2.2	3.4	U	0.0962	0.0407	0.0814	0.1258
Thorium-234	77	11	22	28		2.849	0.407	0.814	1.036

# AMBIENT AIR MONITORING RESULTS AT THE WASTE ISOLATION PILOT PLANT (WIPP) AND THE VICINITY CARLSBAD, NEW MEXICO

## ***WPL02 Far Field***

**February 21, 2014 to February 28, 2014**

Analyte	pCi/sample					Bq/sample			
	Result	±1 s TPU	±2 s TPU	MDA	Lab Flag	Result	±1 s TPU	±2 s TPU	MDA
<b>Gross alpha and beta activity</b>									
Gross alpha	2.1	0.28	0.56	0.54		0.0777	0.01036	0.02072	0.01998
Gross beta	26	2.1	4.20	1.1		0.962	0.0777	0.1554	0.0407
<b>Alpha and beta emitters</b>									
Americium-241	0.0045	0.0091	0.0182	0.035	U	0.0001665	0.000337	0.0006734	0.001295
Plutonium-238	0.015	0.0075	0.0150	0.0082		0.000555	0.000278	0.000555	0.0003034
Plutonium-239/240	0.0060	0.0074	0.0148	0.028	U	0.000222	0.000274	0.0005476	0.001036
Strontium-90	-0.062	0.13	0.26	0.56	U	-0.002294	0.00481	0.00962	0.02072
<b>Gamma emitters</b>									
Actinium-228	5.9	3.1	6.2	10	U	0.2183	0.1147	0.2294	0.37
Americium-241	-5.5	9.3	18.6	32	U	-0.2035	0.3441	0.6882	1.184
Beryllium-7	130	11	22	20		4.81	0.407	0.814	0.74
Bismuth-212	11	10	20	35	U	0.407	0.37	0.74	1.295
Bismuth-214	5.8	1.7	3.4	5.1	J	0.2146	0.0629	0.1258	0.1887
Cesium-134	0.42	0.76	1.52	2.6	U	0.01554	0.02812	0.05624	0.0962
Cesium-137	0.05	0.76	1.52	2.6	U	0.00185	0.02812	0.05624	0.0962
Cobalt-60	0.14	0.89	1.78	3.1	U	0.00518	0.03293	0.06586	0.1147
Iodine-131	-0.13	0.8	1.6	2.8	U	-0.00481	0.0296	0.0592	0.1036
Lead-212	-0.19	1.5	3.0	5.2	U	-0.00703	0.0555	0.111	0.1924
Lead-214	2.2	1.3	2.6	4.2	UU	0.0814	0.0481	0.0962	0.1554
Potassium-40	-28	20	40	70	U	-1.036	0.74	1.48	2.59
Protactinium-234m	47	120	240	420	U	1.739	4.44	8.88	15.54
Sodium-22	0.31	0.81	1.62	2.8	U	0.01147	0.02997	0.05994	0.1036
Thallium-208	2.4	0.73	1.46	2.3		0.0888	0.02701	0.05402	0.0851
Thorium-234	22	16	32	53	U	0.814	0.592	1.184	1.961

**AMBIENT AIR MONITORING RESULTS AT THE WASTE ISOLATION PILOT PLANT (WIPP) AND THE VICINITY  
CARLSBAD, NEW MEXICO**

**WPL03 Met Tower**

**February 21, 2014 to February 28, 2014**

Analyte	pCi/sample					Bq/sample			
	Result	±1 s TPU	±2 s TPU	MDA	Lab Flag	Result	±1 s TPU	±2 s TPU	MDA
Gross alpha and beta activity									
Gross alpha	2.0	0.26	0.52	0.49		0.074	0.00962	0.01924	0.01813
Gross beta	22	1.8	3.60	1.1		0.814	0.0666	0.1332	0.0407
Alpha and beta emitters									
Americium-241	-0.00040	0.0084	0.0168	0.034	U	-0.0000148	0.000311	0.0006216	0.001258
Plutonium-238	0	0.0056	0.0112	0.017	U	0	0.000207	0.0004144	0.000629
Plutonium-239/240	0.0092	0.0057	0.0114	0.0062		0.0003404	0.000211	0.0004218	0.0002294
Strontium-90	-0.098	0.14	0.28	0.62	U	-0.003626	0.00518	0.01036	0.02294
Gamma emitters									
Actinium-228	8.0	6.3	12.6	21	U	0.296	0.2331	0.4662	0.777
Americium-241	0.050	0.97	1.94	3.3	U	0.00185	0.03589	0.07178	0.1221
Beryllium-7	140	13	26	24		5.18	0.481	0.962	0.888
Bismuth-212	15	21	42	71	U	0.555	0.777	1.554	2.627
Bismuth-214	3.9	2.3	4.6	7.4	UJ	0.1443	0.0851	0.1702	0.2738
Cesium-134	1.1	1.0	2.0	3.4	U	0.0407	0.037	0.074	0.1258
Cesium-137	0.98	0.93	1.86	3.1	U	0.03626	0.03441	0.06882	0.1147
Cobalt-60	-1.7	1.1	2.2	4.2	U	-0.0629	0.0407	0.0814	0.1554
Iodine-131	-0.62	0.99	1.98	3.5	U	-0.02294	0.03663	0.07326	0.1295
Lead-212	0.71	1.8	3.6	5.9	U	0.02627	0.0666	0.1332	0.2183
Lead-214	1.9	2.5	5.0	8.4	UJ	0.0703	0.0925	0.185	0.3108
Potassium-40	-24	22	44	76	U	-0.888	0.814	1.628	2.812
Protactinium-234m	-110	160	320	590	U	-4.07	5.92	11.84	21.83
Sodium-22	-1.2	1.1	2.2	4.1	U	-0.0444	0.0407	0.0814	0.1517
Thallium-208	0.82	1.6	3.2	5.5	U	0.03034	0.0592	0.1184	0.2035
Thorium-234	5.9	11	22	38	U	0.2183	0.407	0.814	1.406

**AMBIENT AIR MONITORING RESULTS AT THE WASTE ISOLATION PILOT PLANT (WIPP) AND THE VICINITY  
CARLSBAD, NEW MEXICO**

***WPL03 Met Tower (laboratory duplicate)***

**February 21, 2014 to February 28, 2014**

Analyte	pCi/sample					Bq/sample			
	Result	±1 s TPU	±2 s TPU	MDA	Lab Flag	Result	±1 s TPU	±2 s TPU	MDA
<b>Gamma emitters</b>									
Actinium-228	-0.25	8.9	17.8	32	U	-0.00925	0.3293	0.6586	1.184
Americium-241	2.4	2.0	4.0	6.8	U	0.0888	0.074	0.148	0.2516
Beryllium-7	130	21	42	46		4.81	0.777	1.554	1.702
Bismuth-212	-29	38	76	140	U	-1.073	1.406	2.812	5.18
Bismuth-214	-3.4	5.4	10.8	19	UJ	-0.1258	0.1998	0.3996	0.703
Cesium-134	-0.41	2.0	4.0	7.1	U	-0.01517	0.074	0.148	0.2627
Cesium-137	1.8	2.1	4.2	7.2	U	0.0666	0.0777	0.1554	0.2664
Cobalt-60	-2.6	2.5	5.0	10	U	-0.0962	0.0925	0.185	0.37
Iodine-131	1.1	2.4	4.8	8.3	U	0.0407	0.0888	0.1776	0.3071
Lead-212	0.34	2.2	4.4	7.8	U	0.01258	0.0814	0.1628	0.2886
Lead-214	3.6	4.6	9.2	15	UJ	0.1332	0.1702	0.3404	0.555
Potassium-40	5.5	34	68	120	U	0.2035	1.258	2.516	4.44
Protactinium-234m	110	320	640	1200	U	4.07	11.84	23.68	44.4
Sodium-22	-3.4	2.4	4.8	9.9	U	-0.1258	0.0888	0.1776	0.3663
Thallium-208	0.6	2.4	4.8	8.3	U	0.0222	0.0888	0.1776	0.3071
Thorium-234	15	18	36	62	U	0.555	0.666	1.332	2.294

**AMBIENT AIR MONITORING RESULTS AT THE WASTE ISOLATION PILOT PLANT (WIPP) AND THE VICINITY  
CARLSBAD, NEW MEXICO**

**Filter Blank**

**February 21, 2014 to February 28, 2014**

Analyte	pCi/sample					Bq/sample			
	Result	±1 s TPU	±2 s TPU	MDA	Lab Flag	Result	±1 s TPU	±2 s TPU	MDA
Gross alpha and beta activity									
Gross alpha	-0.05	0.17	0.34	0.58	U	-0.00185	0.00629	0.01258	0.02146
Gross beta	-0.48	0.34	0.68	1.1	U	-0.01776	0.01258	0.02516	0.0407
Alpha and beta emitters									
Americium-241	-0.0023	0.0083	0.0166	0.035	U	-0.0000851	0.000307	0.0006142	0.001295
Plutonium-238	0.013	0.0081	0.0162	0.024	U	0.000481	0.0003	0.0005994	0.000888
Plutonium-239/240	0	0.0080	0.0160	0.035	U	0	0.000296	0.000592	0.001295
Strontium-90	0.19	0.14	0.28	0.60	U	0.00703	0.00518	0.01036	0.0222
Gamma emitters									
Actinium-228	2.6	5.2	10.4	17	U	0.0962	0.1924	0.3848	0.629
Americium-241	24	15	30	48	U	0.888	0.555	1.11	1.776
Beryllium-7	-3.0	6.1	12.2	21	U	-0.111	0.2257	0.4514	0.777
Bismuth-212	-8.8	11	22	40	U	-0.3256	0.407	0.814	1.48
Bismuth-214	5.4	2.1	4.2	6.8	UJ	0.1998	0.0777	0.1554	0.2516
Cesium-134	-0.89	0.98	1.96	3.4	U	-0.03293	0.03626	0.07252	0.1258
Cesium-137	0.22	0.89	1.78	3.0	U	0.00814	0.03293	0.06586	0.111
Cobalt-60	1.2	1.0	2.0	3.3	U	0.0444	0.037	0.074	0.1221
Iodine-131	-0.91	0.94	1.88	3.3	U	-0.03367	0.03478	0.06956	0.1221
Lead-212	-0.29	2.0	4.0	6.6	U	-0.01073	0.074	0.148	0.2442
Lead-214	2.1	2.4	4.8	8.1	UJ	0.0777	0.0888	0.1776	0.2997
Potassium-40	14	20	40	67	U	0.518	0.74	1.48	2.479
Protactinium-234m	-28	180	360	640	U	-1.036	6.66	13.32	23.68
Sodium-22	0.97	0.86	1.72	2.9	U	0.03589	0.03182	0.06364	0.1073
Thallium-208	2.0	1.4	2.8	4.7	U	0.074	0.0518	0.1036	0.1739
Thorium-234	17	21	42	68	U	0.629	0.777	1.554	2.516

# AMBIENT AIR MONITORING RESULTS AT THE WASTE ISOLATION PILOT PLANT (WIPP) AND THE VICINITY CARLSBAD, NEW MEXICO

## **Laboratory Method Blank**

**February 21, 2014 to February 28, 2014**

Analyte	pCi/sample					Bq/sample				
	Result	±1 s TPU	±2 s TPU	MDA	Lab Flag	Result	±1 s TPU	±2 s TPU	MDA	
Gross alpha and beta activity										
Gross alpha	0.82	0.18	0.36	0.5		0.03034	0.00666	0.01332	0.0185	
Gross beta	1.2	0.34	0.68	1.0		0.0444	0.01258	0.02516	0.037	
Alpha and beta emitters										
Americium-241	0.0026	0.0069	0.0138	0.027	U	0.0000962	0.000255	0.0005106	0.000999	
Plutonium-238	0.0045	0.0056	0.0112	0.0061	U	0.0001665	0.000207	0.0004144	0.0002257	
Plutonium-239/240	0.0068	0.0056	0.0112	0.017	U	0.0002516	0.000207	0.0004144	0.000629	
Strontium-90	-0.070	0.12	0.2400	0.55	U	-0.00259	0.00444	0.00888	0.02035	
Gamma emitters										
Actinium-228	-4.9	6.9	13.8	24	U	-0.1813	0.2553	0.5106	0.888	
Americium-241	-0.38	1.1	2.20	3.9	U	-0.01406	0.0407	0.0814	0.1443	
Beryllium-7	-8.2	6.5	13.0	24	U	-0.3034	0.2405	0.481	0.888	
Bismuth-212	-14	27	54	92	U	-0.518	0.999	1.998	3.404	
Bismuth-214	3.5	2.3	4.6	7.7	UJ	0.1295	0.0851	0.1702	0.2849	
Cesium-134	0.85	1.0	2.0	3.5	U	0.03145	0.037	0.074	0.1295	
Cesium-137	0.38	1.0	2.0	3.5	U	0.01406	0.037	0.074	0.1295	
Cobalt-60	-0.65	1.4	2.8	5.0	U	-0.02405	0.0518	0.1036	0.185	
Iodine-131	0.11	0.81	1.62	2.8	U	0.00407	0.02997	0.05994	0.1036	
Lead-212	1.1	2.0	4.0	6.5	U	0.0407	0.074	0.148	0.2405	
Lead-214	7.0	2.0	4.0	6.1	J	0.259	0.074	0.148	0.2257	
Potassium-40	-8.5	24	48	85	U	-0.3145	0.888	1.776	3.145	
Protactinium-234	250	180	360	600	U	9.25	6.66	13.32	22.2	
Sodium-22	-1.0	1.3	2.6	4.9	U	-0.037	0.0481	0.0962	0.1813	
Thallium-208	-1.9	1.7	3.4	6.0	U	-0.0703	0.0629	0.1258	0.222	
Thorium-234	16	11	22	38	U	0.592	0.407	0.814	1.406	

**AMBIENT AIR MONITORING RESULTS AT THE WASTE ISOLATION PILOT PLANT (WIPP) AND THE VICINITY  
CARLSBAD, NEW MEXICO**

**WPL01 WIPP Salt Shaft**

**February 28, 2014 to March 11, 2014**

Analyte	pCi/sample					Bq/sample			
	Result	±1 s TPU	±2 s TPU	MDA	Lab Flag	Result	±1 s TPU	±2 s TPU	MDA
Gross alpha and beta activity									
Gross alpha	3.2	0.34	0.68	0.47		0.1184	0.01258	0.02516	0.01739
Gross beta	32	2.6	5.2	0.93		1.184	0.0962	0.1924	0.03441
Alpha and beta emitters									
Americium-241	0.0040	0.0092	0.0184	0.034	U	0.000148	0.00034	0.0006808	0.001258
Plutonium-238	-0.0057	0.0069	0.0138	0.030	U	-0.0002109	0.000255	0.0005106	0.00111
Plutonium-239/240	0	0.0069	0.0138	0.030	U	0	0.000255	0.0005106	0.00111
Strontium-90	0.18	0.14	0.28	0.57	U	0.00666	0.00518	0.01036	0.02109
Gamma emitters									
Actinium-228	-8.0	10.0	20	40	U	-0.296	0.37	0.74	1.48
Americium-241	63	39	78	130	U	2.331	1.443	2.886	4.81
Beryllium-7	150	25	50	55		5.55	0.925	1.85	2.035
Bismuth-212	-8.9	30	60	110	U	-0.3293	1.11	2.22	4.07
Bismuth-214	5.0	4.8	9.6	16	UJ	0.185	0.1776	0.3552	0.592
Cesium-134	-1.9	2.6	5.2	9.6	U	-0.0703	0.0962	0.1924	0.3552
Cesium-137	-1.7	2.5	5.0	9.6	U	-0.0629	0.0925	0.185	0.3552
Cobalt-60	-1.1	2.2	4.4	9.3	U	-0.0407	0.0814	0.1628	0.3441
Iodine-131	-2.9	2.6	5.2	10	U	-0.1073	0.0962	0.1924	0.37
Lead-212	2.3	3.2	6.4	11	U	0.0851	0.1184	0.2368	0.407
Lead-214	-5.0	4.6	9.2	17	UJ	-0.185	0.1702	0.3404	0.629
Potassium-40	-20	29	58	120	U	-0.74	1.073	2.146	4.44
Protactinium-234m	-150	340	680	1400	U	-5.55	12.58	25.16	51.8
Sodium-22	2.2	1.9	3.8	6.5	U	0.0814	0.0703	0.1406	0.2405
Thallium-208	-0.57	2.5	5.0	9.2	U	-0.02109	0.0925	0.185	0.3404
Thorium-234	-46	33	66	120	U	-1.702	1.221	2.442	4.44

**AMBIENT AIR MONITORING RESULTS AT THE WASTE ISOLATION PILOT PLANT (WIPP) AND THE VICINITY  
CARLSBAD, NEW MEXICO**

**WPL02 Far Field**

**February 28, 2014 to March 11, 2014**

Analyte	pCi/sample					Bq/sample			
	Result	±1 s TPU	±2 s TPU	MDA	Lab Flag	Result	±1 s TPU	±2 s TPU	MDA
Gross alpha and beta activity									
Gross alpha	2.7	0.31	0.62	0.53		0.0999	0.01147	0.02294	0.01961
Gross beta	29	2.4	4.8	0.92		1.073	0.0888	0.1776	0.03404
Alpha and beta emitters									
Americium-241	-0.0047	0.0062	0.0124	0.028	U	-0.0001739	0.000229	0.0004588	0.001036
Plutonium-238	0.0070	0.0058	0.0116	0.017	U	0.000259	0.000215	0.0004292	0.000629
Plutonium-239/240	0.0070	0.0071	0.0142	0.025	U	0.000259	0.000263	0.0005254	0.000925
Strontium-90	0.0065	0.10	0.20	0.42	U	0.0002405	0.0037	0.0074	0.01554
Gamma emitters									
Actinium-228	21	9.6	19.2	30	U	0.777	0.3552	0.7104	1.11
Americium-241	18	8.6	17.2	27	U	0.666	0.3182	0.6364	0.999
Beryllium-7	180	27	54	61		6.66	0.999	1.998	2.257
Bismuth-212	30	29	58	100	U	1.11	1.073	2.146	3.7
Bismuth-214	4.1	5.3	10.6	18	UU	0.1517	0.1961	0.3922	0.666
Cesium-134	0.48	2.3	4.6	8.2	U	0.01776	0.0851	0.1702	0.3034
Cesium-137	-1.4	2.3	4.6	8.5	U	-0.0518	0.0851	0.1702	0.3145
Cobalt-60	4.7	3.0	6.0	9.8	U	0.1739	0.111	0.222	0.3626
Iodine-131	-0.84	2.5	5.0	9.1	U	-0.03108	0.0925	0.185	0.3367
Lead-212	0.80	2.8	5.6	9.7	U	0.0296	0.1036	0.2072	0.3589
Lead-214	1.5	4.1	8.2	14	UU	0.0555	0.1517	0.3034	0.518
Potassium-40	-42	45	90	170	U	-1.554	1.665	3.33	6.29
Protactinium-234m	-460	510	1020	2000	U	-17.02	18.87	37.74	74
Sodium-22	-1.8	2.6	5.2	10	U	-0.0666	0.0962	0.1924	0.37
Thallium-208	-1.2	2.4	4.8	8.9	U	-0.0444	0.0888	0.1776	0.3293
Thorium-234	-23	27	54	95	U	-0.851	0.999	1.998	3.515

**AMBIENT AIR MONITORING RESULTS AT THE WASTE ISOLATION PILOT PLANT (WIPP) AND THE VICINITY  
CARLSBAD, NEW MEXICO**

**WPL02 Far Field (*laboratory duplicate*)**

**February 28, 2014 to March 11, 2014**

Analyte	pCi/sample					Bq/sample				
	Result	±1 s TPU	±2 s TPU	MDA	Lab Flag	Result	±1 s TPU	±2 s TPU	MDA	
Gamma emitters										
Actinium-228	-19	13	26	54	U	-0.703	0.481	0.962	1.998	
Americium-241	-17	17	34	63	U	-0.629	0.629	1.258	2.331	
Beryllium-7	110	23	46	53		4.07	0.851	1.702	1.961	
Bismuth-212	68	46	92	150	U	2.516	1.702	3.404	5.55	
Bismuth-214	-3.4	7.4	14.8	27	UJ	-0.1258	0.2738	0.5476	0.999	
Cesium-134	-4.1	3.5	7.0	13	U	-0.1517	0.1295	0.259	0.481	
Cesium-137	0.87	2.7	5.4	9.7	U	0.03219	0.0999	0.1998	0.3589	
Cobalt-60	2.4	4.3	8.6	15	U	0.0888	0.1591	0.3182	0.555	
Iodine-131	-6.1	3.4	6.8	13	U	-0.2257	0.1258	0.2516	0.481	
Lead-212	1.0	4.2	8.4	14	U	0.037	0.1554	0.3108	0.518	
Lead-214	-4.0	5.5	11	20	UJ	-0.148	0.2035	0.407	0.74	
Potassium-40	65	47	94	160	U	2.405	1.739	3.478	5.92	
Protactinium-234m	-63	470	940	1800	U	-2.331	17.39	34.78	66.6	
Sodium-22	3.3	3.6	7.2	13	U	0.1221	0.1332	0.2664	0.481	
Thallium-208	3.2	3.3	6.6	11	U	0.1184	0.1221	0.2442	0.407	
Thorium-234	-40	33	66	120	U	-1.48	1.221	2.442	4.44	

**AMBIENT AIR MONITORING RESULTS AT THE WASTE ISOLATION PILOT PLANT (WIPP) AND THE VICINITY  
CARLSBAD, NEW MEXICO**

**WPL03 Met Tower**

**February 28, 2014 to March 11, 2014**

Analyte	pCi/sample					Bq/sample			
	Result	±1 s TPU	±2 s TPU	MDA	Lab Flag	Result	±1 s TPU	±2 s TPU	MDA
Gross alpha and beta activity									
Gross alpha	3.0	0.32	0.64	0.48		0.111	0.01184	0.02368	0.01776
Gross beta	27	2.2	4.4	0.93		0.999	0.0814	0.1628	0.03441
Alpha and beta emitters									
Americium-241	0.0071	0.0083	0.0166	0.030	U	0.0002627	0.000307	0.0006142	0.00111
Plutonium-238	0.027	0.011	0.022	0.024		0.000999	0.000407	0.000814	0.000888
Plutonium-239/240	0.030	0.012	0.024	0.031	U	0.00111	0.000444	0.000888	0.001147
Strontium-90	-0.46	0.18	0.36	0.71	U	-0.01702	0.00666	0.01332	0.02627
Gamma emitters									
Actinium-228	-1.9	15	30	55	U	-0.0703	0.555	1.11	2.035
Americium-241	-24	17	34	64	U	-0.888	0.629	1.258	2.368
Beryllium-7	170	32	64	78		6.29	1.184	2.368	2.886
Bismuth-212	-19	44	88	170	U	-0.703	1.628	3.256	6.29
Bismuth-214	4.3	7.4	14.8	26	UJ	0.1591	0.2738	0.5476	0.962
Cesium-134	-2.7	3.2	6.4	12	U	-0.0999	0.1184	0.2368	0.444
Cesium-137	0.87	2.6	5.2	9.5	U	0.03219	0.0962	0.1924	0.3515
Cobalt-60	-4.5	3.9	7.8	16	U	-0.1665	0.1443	0.2886	0.592
Iodine-131	2.7	3.8	7.6	13	U	0.0999	0.1406	0.2812	0.481
Lead-212	-1.0	4.0	8.0	14	U	-0.037	0.148	0.296	0.518
Lead-214	2.5	5.9	11.8	20	UJ	0.0925	0.2183	0.4366	0.74
Potassium-40	26	46	92	160	U	0.962	1.702	3.404	5.92
Protactinium-234m	570	540	1080	1900	U	21.09	19.98	39.96	70.3
Sodium-22	-3.5	4.0	8.0	16	U	-0.1295	0.148	0.296	0.592
Thallium-208	-4.9	3.4	6.8	13	U	-0.1813	0.1258	0.2516	0.481
Thorium-234	18	30	60	100	U	0.666	1.11	2.22	3.7

**AMBIENT AIR MONITORING RESULTS AT THE WASTE ISOLATION PILOT PLANT (WIPP) AND THE VICINITY  
CARLSBAD, NEW MEXICO**

**WPL10 Carlsbad (Guadalupe St.)**

**February 28, 2014 to March 11, 2014**

Analyte	pCi/sample					Bq/sample			
	Result	±1 s TPU	±2 s TPU	MDA	Lab Flag	Result	±1 s TPU	±2 s TPU	MDA
Gross alpha and beta activity									
Gross alpha	2.6	0.30	0.60	0.51		0.0962	0.0111	0.0222	0.01887
Gross beta	24	1.9	3.8	0.87		0.888	0.0703	0.1406	0.03219
Alpha and beta emitters									
Americium-241	-0.0025	0.0066	0.0132	0.028	U	-0.0000925	0.000244	0.0004884	0.001036
Plutonium-238	0.016	0.0068	0.0136	0.0074		0.000592	0.000252	0.0005032	0.0002738
Plutonium-239/240	0.022	0.0079	0.0158	0.0074		0.000814	0.000292	0.0005846	0.0002738
Strontium-90	-0.10	0.18	0.36	0.73	U	-0.0037	0.00666	0.01332	0.02701
Gamma emitters									
Actinium-228	-2.1	10	20	39	U	-0.0777	0.37	0.74	1.443
Americium-241	12	28	56	96	U	0.444	1.036	2.072	3.552
Beryllium-7	160	28	56	65		5.92	1.036	2.072	2.405
Bismuth-212	77	33	66	100	U	2.849	1.221	2.442	3.7
Bismuth-214	-2.6	6.0	12	22	UJ	-0.0962	0.222	0.444	0.814
Cesium-134	-0.63	2.5	5.0	9.2	U	-0.02331	0.0925	0.185	0.3404
Cesium-137	-1.2	2.4	4.8	9.2	U	-0.0444	0.0888	0.1776	0.3404
Cobalt-60	-3.7	2.8	5.6	12	U	-0.1369	0.1036	0.2072	0.444
Iodine-131	3.5	3.4	6.8	11	U	0.1295	0.1258	0.2516	0.407
Lead-212	-7.3	3.6	7.2	14	U	-0.2701	0.1332	0.2664	0.518
Lead-214	6.5	4.4	8.8	15	UJ	0.2405	0.1628	0.3256	0.555
Potassium-40	-49	39	78	160	U	-1.813	1.443	2.886	5.92
Protactinium-234m	-170	410	820	1600	U	-6.29	15.17	30.34	59.2
Sodium-22	-1.3	2.4	4.8	10	U	-0.0481	0.0888	0.1776	0.37
Thallium-208	3.9	2.8	5.6	9.3	U	0.1443	0.1036	0.2072	0.3441
Thorium-234	-36	28	56	100	U	-1.332	1.036	2.072	3.7

**AMBIENT AIR MONITORING RESULTS AT THE WASTE ISOLATION PILOT PLANT (WIPP) AND THE VICINITY  
CARLSBAD, NEW MEXICO**

**WPL11 Carlsbad Mobile Solar**

**February 28, 2014 to March 11, 2014**

Analyte	pCi/sample					Bq/sample			
	Result	±1 s TPU	±2 s TPU	MDA	Lab Flag	Result	±1 s TPU	±2 s TPU	MDA
Gross alpha and beta activity									
Gross alpha	0.50	0.23	0.46	0.75	U	0.0185	0.00851	0.01702	0.02775
Gross beta	7.3	0.69	1.38	1.0		0.2701	0.02553	0.05106	0.037
Alpha and beta emitters									
Americium-241	-0.010	0.0080	0.016	0.037	U	-0.00037	0.000296	0.000592	0.001369
Plutonium-238	0.0068	0.0055	0.011	0.017	U	0.0002516	0.000204	0.000407	0.000629
Plutonium-239/240	0.009	0.0064	0.0128	0.021	U	0.000333	0.000237	0.0004736	0.000777
Strontium-90	0.12	0.10	0.20	0.41	U	0.00444	0.0037	0.0074	0.01517
Gamma emitters									
Actinium-228	12	9.9	19.8	33	U	0.444	0.3663	0.7326	1.221
Americium-241	3.9	12	24	42	U	0.1443	0.444	0.888	1.554
Beryllium-7	51	19	38	60	U	1.887	0.703	1.406	2.22
Bismuth-212	39	32	64	100	U	1.443	1.184	2.368	3.7
Bismuth-214	17	5.1	10.2	16	J	0.629	0.1887	0.3774	0.592
Cesium-134	-6.6	2.4	4.8	8.5	U	-0.2442	0.0888	0.1776	0.3145
Cesium-137	3.3	2.2	4.4	7.2	U	0.1221	0.0814	0.1628	0.2664
Cobalt-60	-5.6	2.9	5.8	11	U	-0.2072	0.1073	0.2146	0.407
Iodine-131	-4.6	3.1	6.2	11	U	-0.1702	0.1147	0.2294	0.407
Lead-212	12	3.4	6.8	10		0.444	0.1258	0.2516	0.37
Lead-214	21	4.4	8.8	13	J	0.777	0.1628	0.3256	0.481
Potassium-40	170	34	68	94		6.29	1.258	2.516	3.478
Protactinium-234m	980	410	820	1300	U	36.26	15.17	30.34	48.1
Sodium-22	-0.68	2.7	5.4	9.4	U	-0.02516	0.0999	0.1998	0.3478
Thallium-208	8.6	2.5	5.0	7.8		0.3182	0.0925	0.185	0.2886
Thorium-234	150	32	64	96		5.55	1.184	2.368	3.552

**AMBIENT AIR MONITORING RESULTS AT THE WASTE ISOLATION PILOT PLANT (WIPP) AND THE VICINITY  
CARLSBAD, NEW MEXICO**

**WPL11 Carlsbad Mobile Solar (*laboratory duplicate*)**

**February 28, 2014 to March 11, 2014**

Analyte	pCi/sample					Bq/sample				
	Result	±1 s TPU	±2 s TPU	MDA	Lab Flag	Result	±1 s TPU	±2 s TPU	MDA	
Gamma emitters										
Actinium-228	3.7	11	22	38	U	0.1369	0.407	0.814	1.406	
Americium-241	-0.46	11	22	40	U	-0.01702	0.407	0.814	1.48	
Beryllium-7	50	18	36	54	U	1.85	0.666	1.332	1.998	
Bismuth-212	-16	35	70	120	U	-0.592	1.295	2.59	4.44	
Bismuth-214	2.5	7.1	14.2	24	UU	0.0925	0.2627	0.5254	0.888	
Cesium-134	0	2.2	4.4	7.8	U	0	0.0814	0.1628	0.2886	
Cesium-137	-1.5	2.4	4.8	8.4	U	-0.0555	0.0888	0.1776	0.3108	
Cobalt-60	-1.6	2.7	5.4	9.8	U	-0.0592	0.0999	0.1998	0.3626	
Iodine-131	-7.5	3.7	7.4	13	U	-0.2775	0.1369	0.2738	0.481	
Lead-212	-2.7	4.7	9.4	16	U	-0.0999	0.1739	0.3478	0.592	
Lead-214	-3.3	5.4	10.8	19	UU	-0.1221	0.1998	0.3996	0.703	
Potassium-40	-36	43	86	150	U	-1.332	1.591	3.182	5.55	
Protactinium-234m	-270	390	780	1400	U	-9.99	14.43	28.86	51.8	
Sodium-22	-5.2	2.4	4.8	9.4	U	-0.1924	0.0888	0.1776	0.3478	
Thallium-208	-4.5	3.1	6.2	11	U	-0.1665	0.1147	0.2294	0.407	
Thorium-234	-20	43	86	150	U	-0.74	1.591	3.182	5.55	

**AMBIENT AIR MONITORING RESULTS AT THE WASTE ISOLATION PILOT PLANT (WIPP) AND THE VICINITY  
CARLSBAD, NEW MEXICO**

**Filter Blank**

**February 28, 2014 to March 11, 2014**

Analyte	pCi/sample					Bq/sample			
	Result	±1 s TPU	±2 s TPU	MDA	Lab Flag	Result	±1 s TPU	±2 s TPU	MDA
Gross alpha and beta activity									
Gross alpha	-0.53	0.16	0.32	0.60	U	-0.01961	0.00592	0.01184	0.0222
Gross beta	0.23	0.28	0.56	0.92	U	0.00851	0.01036	0.02072	0.03404
Alpha and beta emitters									
Americium-241	-0.0045	0.0063	0.0126	0.028	U	-0.0001665	0.000233	0.0004662	0.001036
Plutonium-238	0.0023	0.0069	0.0138	0.028	U	0.0000851	0.000255	0.0005106	0.001036
Plutonium-239/240	0.011	0.0057	0.0114	0.0062		0.000407	0.000211	0.0004218	0.0002294
Strontium-90	0.33	0.16	0.32	0.60	U	0.01221	0.00592	0.01184	0.0222
Gamma emitters									
Actinium-228	-15	11	22	46	U	-0.555	0.407	0.814	1.702
Americium-241	-13	27	54	99	U	-0.481	0.999	1.998	3.663
Beryllium-7	5.9	21	42	76	U	0.2183	0.777	1.554	2.812
Bismuth-212	20	42	84	150	U	0.74	1.554	3.108	5.55
Bismuth-214	-5.2	6.4	12.8	24	UJ	-0.1924	0.2368	0.4736	0.888
Cesium-134	-1.1	2.6	5.2	9.8	U	-0.0407	0.0962	0.1924	0.3626
Cesium-137	-0.46	2.2	4.4	8.6	U	-0.01702	0.0814	0.1628	0.3182
Cobalt-60	-2.5	2.2	4.4	11	U	-0.0925	0.0814	0.1628	0.407
Iodine-131	-2.4	3.6	7.2	13	U	-0.0888	0.1332	0.2664	0.481
Lead-212	1.1	3.8	7.6	13	U	0.0407	0.1406	0.2812	0.481
Lead-214	-4.7	5.6	11.2	21	UJ	-0.1739	0.2072	0.4144	0.777
Potassium-40	-33	48	96	180	U	-1.221	1.776	3.552	6.66
Protactinium-234m	-97	440	880	1800	U	-3.589	16.28	32.56	66.6
Sodium-22	2.7	3.2	6.4	11	U	0.0999	0.1184	0.2368	0.407
Thallium-208	-1.8	3.1	6.2	12	U	-0.0666	0.1147	0.2294	0.444
Thorium-234	2.6	29	58	100	U	0.0962	1.073	2.146	3.7

**AMBIENT AIR MONITORING RESULTS AT THE WASTE ISOLATION PILOT PLANT (WIPP) AND THE VICINITY  
CARLSBAD, NEW MEXICO**

**Laboratory Method Blank**

**February 28, 2014 to March 11, 2014**

Analyte	pCi/sample					Bq/sample			
	Result	±1 s TPU	±2 s TPU	MDA	Lab Flag	Result	±1 s TPU	±2 s TPU	MDA
Gross alpha and beta activity									
Gross alpha	0.055	0.14	0.28	0.47	U	0.002035	0.00518	0.01036	0.01739
Gross beta	0.66	0.25	0.50	0.79	U	0.02442	0.00925	0.0185	0.02923
Alpha and beta emitters									
Americium-241	-0.0015	0.0055	0.011	0.024	U	-0.0000555	0.000204	0.000407	0.000888
Plutonium-238	0.0082	0.0051	0.0102	0.0056		0.0003034	0.000189	0.0003774	0.0002072
Plutonium-239/240	0.0082	0.0051	0.0102	0.0056		0.0003034	0.000189	0.0003774	0.0002072
Strontium-90	0.10	0.088	0.176	0.35	U	0.0037	0.003256	0.006512	0.01295
Gamma emitters									
Actinium-228	2.3	8.8	17.6	31	U	0.0851	0.3256	0.6512	1.147
Americium-241	50	31	62	100	U	1.85	1.147	2.294	3.7
Beryllium-7	-9.8	12	24	46	U	-0.3626	0.444	0.888	1.702
Bismuth-212	52	27	54	85	U	1.924	0.999	1.998	3.145
Bismuth-214	2.1	5	10	17	UJ	0.0777	0.185	0.37	0.629
Cesium-134	-3.2	2.2	4.4	8.1	U	-0.1184	0.0814	0.1628	0.2997
Cesium-137	-0.087	1.9	3.8	6.8	U	-0.003219	0.0703	0.1406	0.2516
Cobalt-60	-2.6	1.6	3.2	7.2	U	-0.0962	0.0592	0.1184	0.2664
Iodine-131	-0.45	1.2	2.4	4.5	U	-0.01665	0.0444	0.0888	0.1665
Lead-212	1.7	2.8	5.6	9.7	U	0.0629	0.1036	0.2072	0.3589
Lead-214	-1.5	3.4	6.8	12	UJ	-0.0555	0.1258	0.2516	0.444
Potassium-40	-6.0	27	54	100	U	-0.222	0.999	1.998	3.7
Protactinium-234m	34	360	720	1300	U	1.258	13.32	26.64	48.1
Sodium-22	-1.8	1.6	3.2	7.0	U	-0.0666	0.0592	0.1184	0.259
Thallium-208	-1.6	2.1	4.2	7.7	U	-0.0592	0.0777	0.1554	0.2849
Thorium-234	48	23	46	72	U	1.776	0.851	1.702	2.664

**AMBIENT AIR MONITORING RESULTS AT THE WASTE ISOLATION PILOT PLANT (WIPP) AND THE VICINITY  
CARLSBAD, NEW MEXICO**

**Laboratory Method Blank (laboratory duplicate)**

**February 28, 2014 to March 11, 2014**

Analyte	pCi/sample					Bq/sample				
	Result	±1 s TPU	±2 s TPU	MDA	Lab Flag	Result	±1 s TPU	±2 s TPU	MDA	
Gamma emitters										
Actinium-228	-5.1	9.8	19.6	34	U	-0.1887	0.3626	0.7252	1.258	
Americium-241	14	11	22	35	U	0.518	0.407	0.814	1.295	
Beryllium-7	0.42	13	26	45	U	0.01554	0.481	0.962	1.665	
Bismuth-212	-25	29	58	100	U	-0.925	1.073	2.146	3.7	
Bismuth-214	12	4.4	8.8	14	UJ	0.444	0.1628	0.3256	0.518	
Cesium-134	0.88	2.0	4.0	6.7	U	0.03256	0.074	0.148	0.2479	
Cesium-137	-2	2.0	4.0	7.3	U	-0.074	0.074	0.148	0.2701	
Cobalt-60	-0.90	2.2	4.4	7.8	U	-0.0333	0.0814	0.1628	0.2886	
Iodine-131	-1.8	1.9	3.8	6.7	U	-0.0666	0.0703	0.1406	0.2479	
Lead-212	1.4	4.1	8.2	14	U	0.0518	0.1517	0.3034	0.518	
Lead-214	-3.7	6.1	12.2	21	UJ	-0.1369	0.2257	0.4514	0.777	
Potassium-40	-0.18	39	78	130	U	-0.00666	1.443	2.886	4.81	
Protactinium-234m	580	330	660	1100	U	21.46	12.21	24.42	40.7	
Sodium-22	-0.19	1.9	3.8	6.9	U	-0.00703	0.0703	0.1406	0.2553	
Thallium-208	2.0	3.0	6.0	10	U	0.074	0.111	0.222	0.37	
Thorium-234	-12	38	76	130	U	-0.444	1.406	2.812	4.81	